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for example, on page 8, lines 3-10 and in claim 4 as originally filed. Claims 16, 26 and 40 have been amended to recite the term "juxtaposed," support for which can be found in the specification including, for example, on page 5, lines 9-22; page 7, lines 1-7 and in claims 8, 24 and 39 as originally filed. Claims 31 and 45 have been amended to replace the term "radiation reflecting means" with the term "mirrored surface," support for which can be found in claims 19 and 33 from which they depend, respectively. Claim 33 has been amended to recite a radiation "beam" in part (c) and (d), support for which can be found in the final wherein clause of the claim and elsewhere in the specification including, for example, on page 4, line 11, through page 5, line 8; page 6, lines 1-11 and page 10, lines 23-30. Claim 48 has been amended to remove the term "optionally," support for which can be found in the claim as originally filed. A number of claims have been amended to correct obvious errors including replacement of the word "the" with the word "said" in claims 15 and 38; changing dependence of claims 38 and 40; replacing the word "systems" with the word "system" in claim 48 and removing the word "quartz" from claim 59.

New claims 68-71 have been added. Support for the new claims can be found in the specification including, for example, on page 25, line 3, through page 26, line 29 and in claims 48-50 as originally filed.

As set forth above, the amendments and new claims do not introduce new matter. Therefore, entry of the amendments and new claims is respectfully requested. A marked-up version of the amended claims to show changes made is attached hereto as Appendix A.

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Objection to the Information Disclosure Statement

The Office Action asserts that references cited in the specification have not been considered. Shapiro is a textbook well known to those skilled in the art and generally available in many biomedical libraries. For the convenience of the Examiner, the Shapiro reference is being made of record and submitted herewith in an Information Disclosure Statement.

Objection to the Oath/Declaration

The Notification of Typographical Error in the Spelling of Inventor's Name that was filed on December 4, 2001 was filed under the provisions of M.P.E.P. §605.04(b). This Section of the Manual reads:

When a typographical or transliteration error in the spelling of an inventor's name is discovered during pendency of an application, a petition is not required, nor is a new oath or declaration under 37 CFR 1.63 needed. The Patent and Trademark Office should simply be notified of the error and reference to the notification paper will be made on the previously filed oath or declaration by the Office *nor is a new oath or declaration under 37 CFR 1.63 needed.*

Objection to the Drawings

The Office Action objects to the drawings for allegedly not including the reference sign "6b" described on page 17 of the specification. Applicant submits herewith replacement drawings showing the reference sign 6b in Figure 4B. Accordingly, this ground for rejection has been rendered moot. Additionally, figure 4b has been amended to label the pin hole mirror with reference sign 1 in accordance with the other figures and the specification. In response to the Examiner's approval of these drawing changes, applicant will make a formal submission of the drawing changes directed to the Official Draftsman.

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The Office Action further objects to the drawings for allegedly not showing every feature of the invention specified in the claims. In this regard, the Office Action alleges that the radiation beams orthogonal to each other must be shown in the drawings. Applicant respectfully submits that radiation beams orthogonal to each other are recited in the claims to describe the cooperative relationship between various elements of the invention including, for example, the means for changing direction of propagation and the pin holes of claims 15, 25 and 38. The claimed apparatus and devices, although encompassing embodiments that include radiation or a radiation beam, are not required to include radiation or a radiation beam. Nevertheless, Applicant respectfully submits that the cooperative relationship between the elements recited in claims 15, 25 and 38 is sufficiently clear from the drawings because Figure 4B shows a radiation directing device **1** having a means for changing the direction of propagation **1e** that is placed to direct radiation beam **7c** in a direction that is orthogonal to radiation beam **7b**, either radiation beam being optionally present. Accordingly, reconsideration and withdrawal of this objection is respectfully requested.

Objection to the Specification

The Office Action objects to the abstract for allegedly having improper language. Applicant respectfully traverse the objection and submits that the abstract satisfies the requirements for proper language and format. However in order to further prosecution of this application, the abstract been amended to comport with the Examiner's suggestion. Accordingly, Applicant requests that the objection be withdrawn.

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Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 16, 26, 27, 31, 38, 40, 41, 48-50 and 65-67 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant respectfully traverses the rejection for the reasons set forth below.

The Office Action alleges that claims 16, 26 and 40, fail to particularly point out what is placed. Applicant respectfully submits that the claims point out with sufficient clarity that the means for changing direction is placed at an angle β with respect to a line intersecting the pin holes. Nevertheless, in order to further prosecution of this application, claims 16, 26 and 40 have been amended to recite "wherein said means for changing direction is juxtaposed at an angle β with respect to a line intersecting said pin holes." Applicant respectfully submits that the placement of the means for changing direction, as claimed, is sufficiently clear in view of the teaching and guidance in the specification. In this regard, the specification provides teaching and guidance for making and using a radiation directing device having the claimed juxtaposition, for example, on page 16, line 17, through page 17, line 21, and further provides an exemplary diagram of the claimed juxtaposition in Figures 4A and 4B.

The Office Action further alleges that there is insufficient antecedent basis for the phrase "said radiation reflecting means" in claim 31. Claim 31 has been amended to replace the phrase with the term "mirrored surface." Applicant respectfully submits that the term "mirrored surface" has antecedent basis in claim 19.

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The Office Action further alleges that there is insufficient antecedent basis for the phrase "the means for changing the direction of propagation" in claim 38, the phrase "said means for changing direction" in claim 40 and for the phrase "said direction changing means" in claim 41. Claim 40 has been amended to depend from claim 39. Claim 41 depends from claim 40. Applicant respectfully submits that the phrases recited in claims 38, 40 and 41, as amended, have antecedent in the phrase "means for changing the direction of propagation" recited in claim 39.

The Office Action further alleges that claim 48 is indefinite for reciting the term "optionally." Claim 48 has been amended to remove the term and new claims 68-71, directed to the optionally recited embodiments have been added. Therefore, the rejection is rendered moot.

The Office Action further alleges that claims 33-47 and 62-64 are incomplete for omitting the structural cooperative relationships of elements in the claims. Applicant respectfully traverses the rejection because the cooperative relationship between the elements recited in claims 33-47 and 62-64 is sufficiently clear from their relationship to a radiation beam as recited in the claims. Nevertheless, in order to further prosecution of this application, claim 33 has been amended to recite a radiation beam directed to the screen in part (c) and to refer to "said" radiation beam in part (d). Accordingly, reconsideration and withdrawal of the rejection of claims 16, 26, 27, 31, 38, 40, 41, 48-50 and 65-67, under 35 U.S.C. § 112, second paragraph, is respectfully requested.

Rejections Under 35 U.S.C. § 102(b)

Applicant respectfully traverses the rejection of claims 1-3, 19-22, 28, 30-32, 51-53, 55, 59 and 61, under 35 U.S.C. §

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102(b), as allegedly anticipated by Walker et al., U.S. Pat. No. 3,813,172. Claims 1-3, 51-53, 55, 59 and 61, as amended, recite that the major axis of the elliptical pin holes is about 0.1 to 2 mm. As set forth on page 9, lines 11-13, of the Office Action, Walker et al. does not describe any apertures having a major axis of about 0.1 to 2 mm. As such Walker et al. doe snot anticipate the claims.

Regarding claims 19-22, 28 and 30-32, Applicant respectfully disagrees with the assertion on page 6, lines 6-13, that Walker et al. describes an apparatus wherein the detecting means determines a position of a radiation beam relative to the pin hole. Walker et al. describes a photometric device for visually observing the area of a subject or source on a mirror surface, having an aperture, and determining a location of the aperture in a reflected image of the subject (see paragraph spanning columns 5 and 6). Walker et al. does not describe the image produced on the mirror surface as being produced by a radiation beam. Furthermore, Walker does not describe the photometric device as being capable of identifying any particular radiation beam within a reflected image on a mirror surface with sufficient precision to determine position of the radiation beam relative to a pin hole in the mirror. Therefore, Applicant respectfully submits that claims 19-22, which recite that the detecting means determines a position of a radiation beam relative to the pin hole, are not anticipated by Walker et al. Accordingly, reconsideration and withdrawal of the rejection of claims 1-3, 19-22, 28, 30-32, 51-53, 55, 59 and 61 as allegedly anticipated by Walker et al. is respectfully requested.

Applicant respectfully traverses the rejection of claim 48, under 35 U.S.C. § 102(b), as allegedly anticipated by Piwonka-Corle et al., U.S. Pat. No. 5,608,526. Applicant respectfully

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submits that claim 48, as amended, recites a means for directing a radiation beam to a screen, the directing means attached to a positioning device. Although, Piwonka-Corle et al. describes on column 13, line 64, through column 14, line 35, a spectroscopic ellipsometry apparatus having an autofocus assembly with a collection mirror that reflects radiation to an apertured mirror, Piwonka-Corle et al. does not describe the collection mirror as being attached to a positioning device. Rather, Piwonka-Corle et al. describes a processor that generates focus control signals that are used for focusing a sample and the signals are described as controlling the position of the sample stage (see column 14, lines 19-27). There is no description in Piwonka-Corle et al. of a positioning device attached to any other component of the autofocus assembly. Absent a description of the positioning device attached to the directing means as recited in claim 48, Piwonka-Corle et al. does not anticipate claim 48. Accordingly, reconsideration and withdrawal of the rejection of claim 48 as allegedly anticipated by Piwonka-Corle et al. is respectfully requested.

Rejections Under 35 U.S.C. § 103(a)

Applicant respectfully traverses the rejection of claims 4, 6, 7, 23 and 29, under 35 U.S.C. § 103(a), as allegedly obvious over Walker et al.

The rejection of claim 4 is moot because claim 4 has been cancelled. However, because claim 1 has been amended to recite "wherein the major axis of said elliptical pin holes is about 0.1 to 2 mm," Applicant will respond to the rejection as if it were applied to amended claim 1.

In regard to amended claim 1, Applicant respectfully submits that a *prima facie* case of obviousness has not been established

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because the Office Action has not established that all of the elements of the claim have been taught or suggested in the art of record.

To establish prima facie obviousness of a claimed invention all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)

See MPEP 2143.03, page 2100-126, column 2, first full paragraph. Applicant again acknowledges the assertion on page 9, lines 11-13 of the Office Action that Walker et al. does not teach the element of elliptical pin holes having a major axis of about 0.1 to 2 mm. Applicant further submits that Walker et al. does not describe any actual dimensions for the apertures in the aperture mirror. The only apparent description in Walker et al. that would have even implied dimensions for the apertures relies upon a description of the aperture mirror's function. More specifically, Walker et al. describes at column 7, lines 19-28, use of the mirror to view an image where apertures of different sizes appear as black holes in the image, the holes having diameters that vary from 0.001 percent to almost 100 percent of the viewing field. Furthermore, Walker et al. does not describe the size of the viewing field or any related dimensions useful for determining the dimensions of the apertures within. Thus, Walker et al. would not have taught or suggested the claimed dimensions of about 0.1 to 2 mm with sufficient specificity that one skilled in the art would have been motivated to select and use, in the aperture mirror, pin holes having the claimed dimensions over pin holes having any of the myriad possible dimensions that satisfy the functional description of the aperture mirror.

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Furthermore, a *prima facie* case of obviousness has not been established because the Office Action has not established motivation to use elliptical pin holes having a major axis of 0.1 to 2 mm in the aperture mirror of Walker et al. The Office Action alleges that it would have been obvious to one of ordinary skill to select areas having an elliptical major axis of 0.1 to 2 mm for the pin holes in the radiation directing device of Walker et al. in order to obtain measuring fields of desired dimensions. However, the Office Action does not point to any suggestion of what the desired dimensions are or how to obtain any desired dimensions with pin holes having dimensions of 0.1 to 2 mm. There is no teaching or suggestion in Walker et al. that elliptical pin holes having a major axis of 0.1 to 2 mm are desired or in any way advantageous to the function of the photometric device. The function of the apertures in the aperture mirror of Walker et al. provide accurate clear definitions of one or more measuring fields of various sizes within a larger field of view, as described in the paragraph spanning columns 1 and 2 of Walker et al. Thus, the apertures in the mirror of Walker et al. function to pass only a portion of the radiation being used in the photometric device. In contrast, the pin holes of the radiation directing device of claim 1 have dimensions that pass an entire radiation beam when the beam is properly aligned such that all of the useful radiation passes through the pin holes (see, for example, page 13, lines 24-32, of the specification). Those skilled in the art would not have been motivated to modify the device of Walker et al. from one that has a function of passing only a portion of the useful radiation in a reflected image to include pin holes having dimensions that pass an entire aligned radiation beam and amended claim 1 would not have been obvious.

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In regard to claim 6, Applicant respectfully submits that because claim 6 depends from amended claim 1, claim 6 would not have been obvious for the reasons set forth above. Furthermore, Applicant respectfully submits that Walker et al. does not describe any surface dimensions for the aperture mirror. Thus, for the reasons set forth above with regard to the absence of description of aperture dimensions, Walker et al. does not teach or suggest the claimed dimensions of 18 mm by 18 mm with sufficient specificity that one skilled in the art would have been motivated to select and use an aperture mirror having the claimed dimensions.

Further in regard to claim 6, the Office Action has not established motivation to use a mirror having surface dimensions of 18 mm by 18 mm. The claimed dimensions are for a square shaped mirror surface. Walker et al. describes the aperture mirror as being circular in shape and as mounted for rotation such that different apertures can be brought into register with the measuring light path (see Figure 3 and column 4, lines 19-28). There is no suggestion in the art of record to substitute a square mirror in the photometric device of Walker et al. Rather, a square shaped mirror when substituted in the device of Walker et al. would be inferior compared to a round mirror because the field of view reflected from a square shaped mirror would change as the mirror was rotated. For example, a portion of an image reflected on the corner of a square mirror would alternately disappear and reappear from view as the square mirror was rotated and would lead to confusion regarding orientation of the image and the subject from which it was derived. Thus, those skilled in the art would not have been motivated to substitute a square shaped mirror surface, much less one that had surface

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dimensions of 18 mm by 18 mm in the photometric device of Walker et al. and claim 6 would not have been obvious.

In regard to claim 7, Applicant respectfully submits that because claim 7 depends from amended claim 1, claim 7 would not have been obvious for the reasons set forth above. Further in regard to claim 7 and in regard to claim 23 as well, Applicant respectfully submits that not all of the elements of the claims have been taught or suggested in the art of record. In this regard, the aperture mirror of Walker et al. is shown to contain 6 apertures (see Figure 3). Although Walker et al. describes the mirror as having a plurality of apertures of different sizes, nowhere does Walker et al. suggest any advantage to having fewer than 6 apertures and in particular having only three apertures. Absent any such teaching or suggestion, Walker et al. would not have motivated one of ordinary skill in the art to choose the claimed number of pin holes over any number of pin holes that satisfy the function of the photometric apparatus. Therefore, amended claims 7 and 23 which recite 3 pin holes would not have been obvious.

In regard to claim 29, Applicant respectfully submits that the Office Action has not established any motivation for using an image detection device in combination with the aperture mirror of Walker et al. The Office Action merely asserts that it would be obvious to provide an image detecting device in the radiation detecting device of Walker et al. because provision of an image detecting device instead of direct visual observation is well known in the art.

A statement that modification of the prior art to meet the claimed invention would have been 'well within the ordinary skill of the art at the time the claimed invention was made' because the references relied upon

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teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993)

See MPEP 2143.01, page 2100-124, column 2, first full paragraph. The Office Action does not point to any teaching or suggestion in the art of record for modifying the radiation detecting device of Walker et al. to replace direct visual observation with an image detection device. Furthermore, Walker et al. describes the photometric device as providing "accurate clear definitions of one or more measuring fields of various sizes within a larger field of view" (see the paragraph spanning columns 1 and 2). In view of the description of satisfactory results using direct visual observation with the photometric device of Walker et al. those skilled in the art would not have been motivated to make the alleged modification. Therefore, claim 29 would not have been obvious. Accordingly, reconsideration and withdrawal of this ground for rejection is respectfully requested.

Applicant respectfully traverses the rejection of claims 5, 54 and 60, under 35 U.S.C. § 103(a), as allegedly obvious over Walker et al. in view of Koso, U.S. Pat. No.: 4,801,810.

In regard to claims 5 and 54, Applicant respectfully submits that because claims 5 and 54 depend from amended claim 1, they recite elliptical pin holes having a major axis of 0.1 to 2 mm and would not have been obvious over Walker et al. for the reasons set forth above in response to the obviousness rejection of claims 4, 6, 7, 23 and 29 over Walker et al. Furthermore, Koso does not cure the deficiencies of Walker et al. because the mere description in Koso of a quartz mirror taken alone or in combination with Walker et al. would not have taught or suggested

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modifying an aperture mirror to include elliptical pin holes having a major axis of 0.1 to 2 mm. Therefore claims 5 and 54 would not have been obvious over Walker et al. in view of Koso.

In regard to claim 60, Applicant respectfully points out that claim 60 depends from claim 19, which recites that the detecting means determines a position of a radiation beam relative to a pin hole. Applicant respectfully submits that the Office Action has not established motivation to determine a position of a radiation beam relative to a pin hole in the device of Walker et al. Applicant maintains for the reasons set forth above in response to the novelty rejection of claim 19 that Walker et al., does not describe a detecting means that determines a position of a radiation beam relative to a pin hole. Rather, Walker et al. describes a device for observing an image of a subject and measuring light from an area within the image. Applicant submits that Walker et al. in view of Koso would not have suggested a detecting means that determines a position of a radiation beam relative to a pin hole because such a use for the device of Walker et al. would not be in accordance with the intended purpose of the device. Without conceding that Walker et al. or Koso are prior art Applicant respectfully points out that:

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

See MPEP 2143.01, page 2100-124, column 2, second paragraph. Walker et al. only describes direct visual observation of the mirror surface using an eyepiece for detection (see column 3, lines 25-38). Whether or not Koso allegedly describes a quartz

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mirror, there is no teaching or suggestion in Walker et al. in view of Koso of replacing or altering the eyepiece used in the Walker et al. device. Because Walker et al. in view of Koso describes visual observation of an image reflected from a mirrored surface with an eyepiece and because an eyepiece, although appropriate for viewing a reflected image on a mirrored surface, is inappropriate and potentially dangerous for viewing a beam of radiation reflected from a mirrored surface, there is no suggestion to determine a position of a radiation beam relative to a pin hole in the device of Walker et al. Thus, claim 60 which depends from claim 19, would not have been obvious. Accordingly, reconsideration and withdrawal of this ground for rejection is respectfully requested.

Applicant respectfully traverses the rejection of claims 8-11, 13-18, 24-27, 56 and 58, under 35 U.S.C. § 103(a), as allegedly obvious over Walker et al. in view of Bayrock et al., U.S. Pat. No.: 6,353,657.

In regard to claims 8-11, 13-18, 56 and 58, Applicant respectfully submits that the Office Action has not established any motivation for modifying the aperture mirror of Walker et al. to include a means for changing direction of propagation for radiation beams passing through one or more pin holes, as recited in the claims. According to the description in Walker et al. there are two beam paths from the aperture mirror. The first light path, indicated as "23" in Figure 1 of Walker et al., is a viewing light path for a reflected image and the second beam path, indicated as "22" in Figure 1 of Walker et al., is a measuring light path for light passing through an aperture (see column 3, lines 10-34). Bayrock et al. describes a system and method for optical pathfolding by redirecting an image more than once before providing it to an imaging sensor (see column 2,

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lines 32-38). Because an image viewing light path is described in both references but Bayrock et al. lacks any description of a measuring light path, the combined references would have suggested modification of the image light path "23" by optical pathfolding but would not have suggested any modification of the measuring light path.

Furthermore, even if, for the sake of argument, the references were construed to suggest modifying the device of Walker et al. to include a means for changing direction of propagation for a measuring light path, the references would not have taught or suggested juxtaposition of a direction changing means and one or more pin holes. A general description of minimizing the dimensions of a device housing using multiple redirecting elements would not have been sufficient to suggest a spatial relationship between the apertures and redirecting means in which they are juxtaposed. Such a description amounts to nothing more than a wish to improve a device housing and does not provide any suggestion for how to do so beyond using multiple redirecting elements. Similarly, the general description would not have been sufficient to suggest in sufficient detail an orientation for the direction changing means wherein the means for changing the direction of propagation is placed to direct the radiation beams passing through the 2 or more pin holes orthogonal to each other or to suggest in sufficient detail an orientation wherein the means for changing direction is juxtaposed at an angle β with respect to a line intersecting the pin holes.

Applicant respectfully submits that claims 24-27 depend from claim 19, which recites that the detecting means determines a position of a radiation beam relative to a pin hole. Applicant respectfully maintains that Walker et al. in view of Bayrock et

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al. would not have taught or suggested a detecting means that determines a position of a radiation beam relative to a pin hole because such a use for the device of Walker et al. would not have been in accordance with the intended purpose of the device of Walker et al. as set forth above in response to the obviousness rejection of claim 60 over Walker et al. in view of Koso. Bayrock et al. does not cure the deficiencies of Walker et al. because the mere description of optical folding for an image light path taken alone or in combination with Walker et al. would not have taught or suggested replacing or altering the eyepiece used in the Walker et al. device. Thus, claims 24-27 which depend from claim 19, would not have been obvious. Accordingly, reconsideration and withdrawal of this ground for rejection is respectfully requested.

Applicant respectfully traverses the rejection of claims 12 and 57, under 35 U.S.C. § 103(a), as allegedly obvious over Walker et al. in view of Bayrock et al., further in view of Koso.

Claims 12 and 57 are dependent upon claim 8, which recites a means for changing direction of propagation for radiation beams passing through one or more pin holes. Applicant maintains that Walker et al. in view of Bayrock et al. would not have provided motivation for modifying the aperture mirror of Walker et al. to include a means for changing direction of propagation for radiation beams passing through one or more pin holes, as set forth above in response to the obviousness rejection of claims 8-11, 13-18, 24-27, 56 and 58, over Walker et al. in view of Bayrock et al. Applicant respectfully submits that Koso does not cure the deficiencies of Walker et al. in view of Bayrock et al. because, any description in Koso of a quartz mirror, even when taken with Walker et al. in view of Bayrock et al., would not have provided motivation to alter the aperture mirror of Walker

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et al. to include a means for changing direction of propagation for radiation beams passing through one or more pin holes as recited in claim 8.

Applicant further maintains that Walker et al. in view of Bayrock et al. does not teach or suggest all of the elements of claim 8 including, for example, juxtaposition of the direction changing means and one or more pin holes, as set forth above in response to the obviousness rejection of claims 8-11, 13-18, 24-27, 56 and 58, over Walker et al. in view of Bayrock et al. Applicant respectfully submits that Koso does not cure the deficiencies of the references because any description in Koso of a quartz mirror taken alone or in combination with Walker et al. in view of Bayrock et al. would not have taught or suggested any particular relative position of a pin hole and direction changing means, much less juxtaposition of the direction changing means and pin hole. Accordingly, reconsideration and withdrawal of this ground for rejection is respectfully requested.

Applicant respectfully traverses the rejection of claims 33-37, 42-47, 62 and 64, under 35 U.S.C. § 103(a), as allegedly obvious over Walker et al. in view of Altendorf, U.S. Pat. No.: 6,067,157.

Applicant respectfully points out that claims 33-37, 42-47, 62 and 64 recite that the detecting means determines a position of a radiation beam relative to a pin hole. Applicant respectfully submits that Walker et al. in view of Altendorf would not have taught or suggested the apparatus of claim 19 because the combination of references teaches away from a detecting means that determines a position of a radiation beam. As set forth above in response to the rejection of claim 60 over Walker et al. in view of Koso, there is no teaching or suggestion in Walker et al. of using the photometric device to determine a

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position of a radiation beam because Walker et al. is directed to image detection and, furthermore, observation of the image using an eye-piece, as described in Walker et al. would not be satisfactory for determining a position of a radiation beam.

The combination of Walker et al. and Altendorf teaches away from determining a position of a radiation beam because Altendorf is directed to a device that is designed to prevent detection of a radiation beam. Specifically, Altendorf describes a mirror (55) having a hole in the center to permit transmission of the forward angle scattered light and a beam block (45) that prevents the laser beam from striking the forward angle scatter detector, as set forth on column 7, lines 27-31, of Altendorf. Furthermore, as shown in Figure 7, of Altendorf the beam block (45) is placed to prevent the radiation beam from being reflected on the mirror surface or from passing through the pin hole to respective detectors. In view of the teaching away by Altendorf, those skilled in the art would not have been motivated to modify the device of Walker et al. for determining a position of a radiation beam and claims 33-37, 42-47, 62 and 64 which depend from claim 19, would not have been obvious. Accordingly, reconsideration and withdrawal of this ground for rejection is respectfully requested.

Applicant respectfully traverses the rejection of claims 38-41, under 35 U.S.C. § 103(a), as allegedly obvious over Walker et al. in view of Altendorf, and further in view of Bayrock et al. and the rejection of claim 63, under 35 U.S.C. § 103(a), as allegedly obvious over Walker et al. in view of Altendorf, and further in view of Koso.

Applicant respectfully points out that claims 38-41 and 63 depend from claim 33, which recites that the detecting means determines a position of a radiation beam relative to a pin hole.

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As set forth above in response to the obviousness rejection of claims 33-37, 42-47, 62 and 64, over Walker et al. in view of Altendorf, the combination of Walker et al. and Altendorf teaches away from modifying the device of Walker et al. to determine a position of a radiation beam. Because Bayrock et al. and Koso do not contradict the teaching away of Walker et al. in view of Altendorf, claims 38-41 and 63 would not have been obvious. Accordingly, reconsideration and withdrawal of these grounds for rejection is respectfully requested.

Applicant respectfully traverses the rejection of claims 48, 65 and 67, under 35 U.S.C. § 103(a), as allegedly obvious over Walker et al. in view of Piwonka-Corle et al.

Applicant respectfully submits that the Office Action has not established that all of the elements of claims 48, 65 and 67 have been taught or suggested. In particular, the references when taken alone or in combination do not teach or suggest a means for directing a radiation beam to a screen, the directing means attached to a positioning device, as recited in the claims. Applicant acknowledges the assertion on page 16, lines 18-21 of the Office Action that the system of Walker et al. lacks a computer system controlling movement of a positioning device, said computer system receiving a signal from said detection means and sending a processed output signal to said positioning device, wherein said output signal directs the movement of said positioning device. Applicant further submits that there is no description in Walker et al. of any positioning device controlled by a computer system, much less one that is attached to a means for directing a radiation beam to a screen. Applicant maintains that Piwonka-Corle et al. does not describe a positioning device attached to a means for directing a radiation beam to a screen, as set forth above in response to the novelty rejection of claim

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48 over Piwonka-Corle et al. Absent a description in either of the references of a positioning device attached to a means for directing a radiation beam to a screen, the references would not have taught or suggested the automated system of claims 48, 65 and 67 and the claims would not have been obvious. Accordingly, reconsideration and withdrawal of this ground for rejection is respectfully requested.

Applicant respectfully traverses the rejection of claims 49 and 50, under 35 U.S.C. § 103(a), as allegedly obvious over Walker et al. in view of Piwonka-Corle et al., and further in view of Altendorf.

Claims 49 and 50 depend from claim 48. Applicant maintains that claim 48 would not have been obvious over Walker et al. in view of Piwonka-Corle et al. because the references would not have taught or suggested a positioning device attached to a means for directing a radiation beam to a screen, as set forth above in response to the obviousness rejection of claims 48, 65 and 67 over Walker et al. in view of Piwonka-Corle et al. As recited in claim 48, the positioning device is controlled by a computer system that receives a signal from a detection means that determines a position of the radiation beam relative to a pin hole. Applicant respectfully submits that Altendorf does not cure the deficiencies of Walker et al. in view of Piwonka-Corle et al. because Altendorf teaches away from modifying the device of Walker et al. for determining a position of a radiation beam as set forth above in response to the rejection of claims 33-37, 42-47, 62 and 64, as allegedly obvious over Walker et al. in view of Altendorf. Therefore, claims 49 and 50, which depend from claim 48, would not have been obvious and reconsideration and withdrawal of this rejection is respectfully requested.

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Applicant respectfully traverses the rejection of claim 66, under 35 U.S.C. § 103(a), as allegedly obvious over Walker et al. in view of Piwonka-Corle et al., and further in view of Koso.

Claim 66 depends from claim 48. Applicant maintains that claim 48 would not have been obvious over Walker et al. in view of Piwonka-Corle et al. because the references would not have taught or suggested a positioning device attached to a means for directing a radiation beam to a screen, as set forth above in response to the obviousness rejection of claims 48, 65 and 67 over Walker et al. in view of Piwonka-Corle et al. Applicant respectfully submits that Koso does not cure the deficiencies of the references because any description in Koso of a quartz mirror, when taken alone or in combination with Walker et al. in view of Piwonka-Corle et al. would not have taught or suggested a positioning device attached to a means for directing a radiation beam to a screen. Therefore, claim 66, which depends from claim 48, would not have been obvious and reconsideration and withdrawal of this rejection is respectfully requested.

CONCLUSION

In light of the amendments and remarks herein, Applicant submits that the claims are now in condition for allowance and respectfully requests a notice to this effect. The Examiner is invited to call the undersigned attorney if there are any questions.

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Respectfully submitted,

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OCT 22, 2002
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Version with Markings to Show Changes Made

In the specification

The paragraph starting on page 20, line 28 and ending on page 21, line 21, has been amended as follows:

An apparatus of the invention can be used to determine alignment of a radiation beam emitted from a flow chamber. A flow chamber can contain a sample stream in which emission from molecules or particles is observed when they pass a point of observation. The point of observation can be placed, for example, as shown in Figures 2 and 4 as location **4**. As shown in the Figures, radiation emitted at the point of observation, for example, from fluorescent particles that have been contacted with radiation of an excitatory wavelength, can be collimated [collated] into a beam. The beam can be directed toward a screen having a mirrored surface interrupted by one or more pin holes such that alignment of the beam can be determined from the location of the beam reflection on the mirrored surface.

The abstract of the disclosure, on page 37, has been amended as follows:

This invention provides a radiation directing device, including [consisting of] a screen having a mirrored surface interrupted by one or more pin holes that pass through the screen, the pin holes having an elliptical shape. The invention further provides an apparatus, including [for determining radiation beam alignment. The apparatus includes] (a) a screen having a mirrored surface interrupted by one or more pin holes passing through the screen; and (b) a detector [means] for detecting radiation reflected by the mirrored surface, wherein

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the detector [detecting means] determines a position of a radiation beam relative to the pin hole.

Claims 1, 15, 16, 26, 31, 33, 38, 40, 45, 48, 51, 52, and 59 have been amended as follows:

1. (Amended) A radiation directing device, comprising a screen having a mirrored surface interrupted by one or more pin holes that pass through said screen, said pin holes having an elliptical shape, wherein the major axis of said elliptical pin
5 holes is about 0.1 to 2 mm.

15. (Amended) The apparatus of claim 14, wherein said [the] means for changing the direction of propagation is placed to direct said [the] radiation beams passing through said 2 or more pin holes orthogonal to each other.

16. (Amended) The radiation directing device of claim 14, wherein said means for changing direction is juxtaposed [further comprises placement] at an angle β with respect to a line intersecting said pin holes.

26. (Amended) The radiation directing device of claim 23, wherein said means for changing direction is juxtaposed [further comprises placement] at an angle β with respect to a line intersecting said pin holes.

31. (Amended) The apparatus of claim 19, further comprising a means for directing radiation reflected by said mirrored surface [radiation reflecting means] to said radiation detecting means.

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33. (Amended) A radiation beam aligning apparatus, comprising:

(a) a flow chamber;

(b) a screen having a mirrored surface interrupted by one or more pin holes passing through said screen;

(c) a means for directing a radiation beam from said flow chamber to said screen; and

(d) a means for detecting said radiation beam reflected by said mirrored surface, wherein said detecting means determines a position of said [a] radiation beam relative to said pin hole.

38. (Amended) The apparatus of claim 39 [37], wherein said [the] means for changing the direction of propagation is placed to direct [the] radiation beams passing through said 2 or more pin holes orthogonal to each other.

40. (Amended) The radiation directing device of claim 39 [37], wherein said means for changing direction is juxtaposed [further comprises placement] at an angle β with respect to a line intersecting said pin holes.

45. (Amended) The apparatus of claim 33, further comprising a means for directing radiation reflected by said mirrored surface [radiation reflecting means] to said radiation detecting means.

48. (Amended) An automated system for aligning a radiation beam, comprising:

(a) a screen having a mirrored surface interrupted by one or more pin holes passing through said screen;

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5 (b) a means for directing a radiation beam to said screen,
said directing means [optionally] attached to a positioning
device;

(c) a means for detecting radiation reflected by said
mirrored surface, wherein said detecting means determines a
10 position of a radiation beam relative to said pin hole; and

(d) a computer system [systems] controlling movement of
said positioning device, said computer system receiving a signal
from said detection means and sending a processed output signal
to said positioning device, wherein said output signal directs
15 the movement of said positioning device.

51. (Amended) A radiation directing device, comprising a
mirrored surface interrupted by one or more pin holes, said pin
holes having an elliptical shape, wherein said mirrored surface
prevents passage of radiation in the UV, VIS or IR regions of the
5 spectrum, wherein the major axis of said elliptical pin holes is
about 0.1 to 2 mm.

52. (Amended) A radiation directing device, comprising a
metal coating of a mirror, said metal coating interrupted by one
or more pin holes, said pin holes having an elliptical shape,
wherein the major axis of said elliptical pin holes is about 0.1
5 to 2 mm.

59. (Amended) The apparatus of claim 19, wherein said pin
hole comprises a material transparent to radiation in the UV, VIS
or IR regions of the spectrum [quartz].

New claims 68-71 have been added as follows:

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68. An automated system for aligning a radiation beam, comprising:

(a) a screen having a mirrored surface interrupted by one or more pin holes passing through said screen;

5 (b) a flow chamber, said flow chamber attached to a positioning device;

(c) a means for directing a radiation beam to said screen;

10 (d) a means for detecting radiation reflected by said mirrored surface, wherein said detecting means determines a position of a radiation beam relative to said pin hole; and

(e) a computer system controlling movement of said positioning device, said computer system receiving a signal from said detection means and sending a processed output signal to said positioning device, wherein said output signal directs the
15 movement of said positioning device.

69. The automated system of claim 68, wherein said means for directing a radiation beam to said screen is attached to said positioning device.

70. An automated system for aligning a radiation beam, comprising:

(a) a screen having a mirrored surface interrupted by one or more pin holes passing through said screen;

5 (b) a flow chamber;

(c) a means for directing radiation to said flow chamber, said means for directing radiation to said flow chamber attached to a positioning device;

(d) a means for directing a radiation beam to said screen;

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10 (e) a means for detecting radiation reflected by said
mirrored surface, wherein said detecting means determines a
position of a radiation beam relative to said pin hole; and

(f) a computer system controlling movement of said
positioning device, said computer system receiving a signal from
15 said detection means and sending a processed output signal to
said positioning device, wherein said output signal directs the
movement of said positioning device.

71. The automated system of claim 68, wherein said means
for directing a radiation beam to said screen is attached to said
positioning device.